From:	ANDERSON Jim M
To:	Eric Blischke/R10/USEPA/US@EPA; Chip Humphrey/R10/USEPA/US@EPA; Kristine Koch/R10/USEPA/US@EPA
Cc:	BURKHOLDER Kurt; MCCLINCY Matt; POULSEN Mike; PETERSON Jenn L; GAINER Tom
Subject:	RE: Groundwater RAO for Portland Harbor
Date:	09/24/2009 09:20 AM

Eric,
Your proposed GW RAOs are a vast improvement over the LWG's 9/8/09 proposed GW RAO, but again, DEQ's position on the use of the term "groundwater" in the RAOs hasn't really changed from our position described in our 7/23/09 & 8/7/09 letters to you re: RAOs. Once again, I believe the term "pore water" or "transition zone water" are more appropriate than "groundwater" because those terms more clearly define the precise physical medium where exposure is suspected to occur. I appreciate you removing the term "groundwater" from your 9/22 RAOs 1, 2, 4, & 5.

I think part of the problem of finalizing these RAOs is that the RAOs are supposed to be medium-specific…, i.e., separate RAOs for sediment, surface water, groundwater, etc. However, Footnote ii defines "sediment" to include the solid & water fractions of sediment. Bob Wyatt has repeatedly made the argument that pore water (or in EPA's terms…, "groundwater") is included in lab analyses of bulk sediment samples…, so we're actually accounting for pore water contaminant concentrations in bulk sediment sample analytical results. I don't fully agree with Bob's argument for several reasons, but mainly because the bulk sediment sample lab results are presented in terms of the solid fraction, & we don't get an idea of the actual pore water contaminant contribution to that solid fraction lab result.

I think you're proposing 2 GW RAOs for 2 reasons. 1st, to address stranded wedge GW (i.e., GW downgradient from an effective upland source control measure & upgradient to pore water). 2nd, to address pore water specifically (which…, contrary to Bob's argument…, isn't specifically addressed in bulk sediment analysis results). One of my major concerns with developing GW RAOs is that we just don't have sufficient RI empirical pore water data nor have we directed the LWG to estimate pore water concentrations from GW data &/or sediment data (using…, for example…, equilibrium partitioning). Furthermore, the LWG has not characterized the nature & extent of contamination in the stranded wedge, & therefore it will be very difficult for them to design remedial alternatives to achieve that RAO. Without sufficient GW (or pore water) characterization, it will be difficult for the LWG to achieve the stated RAO goal of reducing "risks to human health from COC concentrations in contaminated groundwater through sediment remedies at the site." If EPA insists on requiring a consideration of the stranded wedge GW in the RAO discussion…, perhaps you could consider stranded wedge GW as a Management Goal rather than an RAO.

If, however, EPA insists on creating separate GW RAOs…, I have several comments on your 9/22 RAOs.

1) RAO X- Human Health Groundwater- What human "direct exposure" to stranded wedge GW do you anticipate? Are you actually thinking someone would install a drinking water well downgradient of a source control measure in the stranded wedge? I think that is an unrealistic & trivial exposure scenario. Furthermore, the PH BRA CSM does not contemplate "direct exposure" to pore water.

2) RAO X- Ecological Groundwater- I agree with this RAO that we should achieve acceptable risk levels for eco receptors directly & indirectly exposed COC concentrations pore water. The point of exposure for eco receptors is the biologically active zone (essentially the transition zone or zone where pore water exists), & obviously eco receptors won't be exposed to GW upgradient to the biologically active zone in the aquifer. With that said, the last sentence of your supporting text is problematic. Is the goal to achieve AWQC in the stranded wedge aquifer, or is it to achieve AWQC at the point of exposure. This is another example of the point-of-compliance issue.

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Subject: Groundwater RAO for Portland Harbor

Following our September, 8, 2009 meeting to discuss RAOs for the Portland Harbor site, the LWG proposed a groundwater RAO. This RAO was distributed previously but is included below for completeness.

RAO Groundwater - Address groundwater contamination beneath the Willamette River, as necessary, to protect the designated beneficial uses of the Willamette River from impairment caused by upwelling of contaminated groundwater, protect the beneficial use of groundwater beneath the Willamette River, and comply with identified ARARs for groundwater applicable to the beneficial uses addressed by this RAO.

This RAO applies to groundwater contamination beneath the Willamette River at appropriate points of compliance to protect these beneficial uses, with the understanding that groundwater plumes that

impair the designated beneficial uses will be addressed through upland source control actions.

We do not believe the above RAO is appropriate for a number of reasons. Most importantly, the above RAO does not match up with the RAOs we directed the LWG to use on August 7, 2009. However, we do appreciate that it would be cleaner to include a separate RAO for groundwater because it represents a separate matrix. We have gone through the latest version of the RAOs, extracted out the references to groundwater and developed two additional groundwater RAOs - one for human health and one for ecological receptors. An updated set of RAOs in redline/strike-out format relative to the August 7, 2009 version is attached. I would like to discuss this at tomorrow's TCT.

Thanks, Eric